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CA 94110 (US). **LIOUBIN, Mario** [US/US]: Sugen, Inc.,
230 East Grand Avenue, South San Francisco, CA 94080
(US).

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(74) Agent: **ISACSON, John, P.**; Foley & Lardner, Suite 500,
3000 K Street, N.W., Washington, DC 20007-5109 (US).

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(71) Applicant (*for all designated States except US*): **SUGEN, INC.** [US/US]; 230 East Grand Avenue, South San Francisco, CA 94080 (US).

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(72) Inventors; and

(75) Inventors/Applicants (*for US only*): **PLOWMAN, Gregory, D.** [US/US]; 4 Honeysuckle Lane, San Carlos, CA 94070 (US). **MARTINEZ, Ricardo** [US/US]; 984 Cartier Lane, Foster City, CA 94404 (US). **WHYTE, David** [US/US]; 2623 Barclay Way, Belmont, CA 94002 (US). **HILL, Ron** [US/US]; Sugen, Inc., 230 East Grand Avenue, South San Francisco, CA 94080 (US). **FLANAGAN, Peter** [US/US]; 192 Liberty Street, San Francisco,

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(54) Title: PROTEIN PHOSPHATASES AND DIAGNOSIS AND TREATMENT OF PHOSPHATASE-RELATED DISORDERS

(57) Abstract: The present invention concerns polypeptides, nucleic acids encoding such polypeptides, cells, tissues and animals containing such nucleic acids, antibodies to the polypeptides, assays utilizing the polypeptides, and methods relating to all of the foregoing. Preferably, the polypeptides of the present invention are phosphatases. Through the use of a "motif extraction" bioinformatics script, additional mammalian members of the phosphatase family are herein presented. These phosphatases include MKP-like proteins, a CDC14-like protein, a PTEN-like protein, and myotubularin (MTM)-like proteins. Classification of proteins as new members of established families has proven highly accurate not only in predicting motifs present in the remaining non-catalytic portion of each protein, but also in their regulation, substrates, and signaling pathways.

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A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 C12N15/55 C12N9/16 C07K16/40 C12Q1/42 C12Q1/68
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According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

CHEM ABS Data, EMBL, EPO-Internal, WPI Data, BIOSIS, STRAND, MEDLINE, EMBASE

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	<p>DATABASE EMBL 'Online! Accession number AI021222, 18 June 1998 (1998-06-18) MARRA, M. ET AL.: " ub03e08.r1 Soares mouse mammary gland NbMMG Mus musculus cDNA clone IMAGE:1365926 5' similar to TR:P91585 P91585 COS41.7. ; mRNA sequence." XP002159207 abstract relevant to invention 1 --- -/--</p>	<p>1-12, 18-23</p>



Further documents are listed in the continuation of box C.



Patent family members are listed in annex.

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Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax: (+31-70) 340-3016

Authorized officer

Morawetz, R

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	<p>DATABASE SWALL 'Online! Accession number 043183, 1 June 1998 (1998-06-01) LI, L. ET AL.: "Tyrosine phosphatase CDC14B" XP002159208 abstract relevant to invention 1 -& LI, L. ET AL.: "A family of putative tumor suppressors is structurally and functionally conserved in humans and yeast." J. BIOL. CHEM, vol. 272, no. 47, 21 November 1997 (1997-11-21), pages 29403-29406, XP002159206</p>	1-12, 18-23
X	<p>DATABASE SWALL 'Online! Accession number P91585, 1 May 1997 (1997-05-01) BIRD, A.P. ET AL.: "COS41.7 from Ciona intestinalis; Tyr phosphatase" XP002159209 the whole document relevant to inventions 1, 20</p>	1-12, 18-23
X	<p>MUDA MARCO ET AL: "Molecular cloning and functional characterization of a novel mitogen-activated protein kinase phosphatase, MKP-4" JOURNAL OF BIOLOGICAL CHEMISTRY, THE AMERICAN SOCIETY OF BIOLOGICAL CHEMISTS, INC., US, vol. 272, no. 8, 1997, pages 5141-5151, XP002144712 ISSN: 0021-9258 relevant to inventions 1, 6, 9, 10, 11, 12, 13, 14, 15, 16</p>	1-12, 18-23
X	<p>DATABASE EMBL 'Online! Accession number AA023073, 10 August 1996 (1996-08-10) MARRA, M. ET AL.: " mh66e03.r1 Soares mouse placenta 4NbMP13.5 14.5 Mus musculus cDNA clone" XP002159242 the whole document relevant to invention 1</p>	1-10

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	<p>DATABASE EMBL 'Online! Accession number AA028820, 17 August 1996 (1996-08-17) MARRA, M. ET AL.: "mh87f02.r1 Soares mouse placenta 4NbMP13.5 14.5 Mus musculus cDNA clone IMAGE:457947 5', mRNA sequence." XP002159243 the whole document relevant to invention 1</p>	1-10
X	<p>DATABASE EMBL 'Online! Accession number AA374753, 18 April 1997 (1997-04-18) ADAMS, M.D. ET AL.: "EST86937 HSC172 cells I Homo sapiens cDNA 5' end similar to similar to tyrosine phosphatase CL100." XP002167448 the whole document relevant to invention 6</p>	1-12, 18-23
X	<p>-& ADAMS, M.D. ET AL.: "Initial assessment of human gene diversity and expression patterns based upon 83 million nucleotides of cDNA sequence" NATURE, vol. 377, 28 September 1995 (1995-09-28), pages 3-174, XP002920293</p>	
X	<p>DATABASE EMBL 'Online! Accession number AA411671, 4 May 1997 (1997-05-04) HILLIER, L. ET AL.: "zv10h07.r1 Soares_NhHMPu_S1 Homo sapiens cDNA clone IMAGE:753277 5' similar to TR:E218398 E218398 DUAL SPECIFICITY PHOSPHATASE, mRNA sequence." XP002167449 relevant to invention 6 the whole document</p>	1-12, 18-23
X	<p>DATABASE EMBL 'Online! Accession number AA461185, 13 June 1997 (1997-06-13) HILLIER, L. ET AL.: "zx70e02.s1 Soares_total_fetus_Nb2HF8_9w Homo sapiens cDNA clone IMAGE:796826 3' similar to WP:ZK757.2 CE00468 PROTEIN-TYROSINE PHOSPHATASE ; mRNA sequence." XP002167685 the whole document relevant to invention 9 abstract</p>	1-12, 18-23

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Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	<p>DATABASE EMBL 'Online! Accession number AA774585, 6 February 1998 (1998-02-06) STRAUSBERG, R.: "ai27e05.s1 Soares_testis_NHT Homo sapiens cDNA clone 1344032 3' similar to SW:DUS3_HUMAN P51452 DUAL SPECIFICITY PROTEIN PHOSPHATASE 3 ; mRNA sequence." XP002168516 the whole document relevant to invention 9</p> <p style="text-align: center;">---</p>	1-12, 18-23
X	<p>DATABASE EMBL 'Online! Accession number AA723271, 8 January 1998 (1998-01-08) HILLIER, L. ET AL.: "zg88b02.s1 Soares_fetal_heart_NbHH19W Homo sapiens cDNA clone IMAGE:409611 3' similar to SW:DUS3_HUMAN P51452 DUAL SPECIFICITY PROTEIN PHOSPHATASE 3 ; mRNA sequence." XP002167684 the whole document relevant to invention 9</p> <p style="text-align: center;">---</p>	1-12, 18-23
X	<p>DATABASE EMBL 'Online! Accession number AA813372, 16 February 1998 (1998-02-16) STRAUSBERG, R.: "aj33b01.s1 Soares_testis_NHT Homo sapiens cDNA clone 1392073 3' similar to TR:Q93592 Q93592 F26A3.4. ; mRNA sequence." XP002167608 the whole document relevant to invention 10</p> <p style="text-align: center;">---</p>	1-12, 18-23
X	<p>DATABASE EMBL 'Online! Accession number AI025489, 19 June 1998 (1998-06-19) STRAUSBERG, R.: "ov67c10.x1 Soares_testis_NHT Homo sapiens cDNA clone IMAGE:1642386 3' similar to WP:F26A3.4 CE09669 PROTEIN-TYROSINE PHOSPHATASE ; mRNA sequence." XP002167609 the whole document relevant to invention 10</p> <p style="text-align: center;">---</p> <p style="text-align: center;">-/--</p>	1-12, 18-23

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Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	<p>DATABASE EMBL 'Online! Accession number AI283262, 24 November 1998 (1998-11-24) STRAUSBERG, R.: "qk50g08.x1 NCI_CGAP_Co8 Homo sapiens cDNA clone IMAGE:1872446 3' similar to WP:F26A3.4 CE09669 PROTEIN-TYROSINE PHOSPHATASE ; mRNA sequence." XP002167450 the whole document relevant to invention 11</p> <p>---</p>	<p>1-12, 18-23</p>
X	<p>DATABASE EMBL 'Online! Accession number AA915932, 16 April 1998 (1998-04-16) STRAUSBERG, R.: " on18c06.s1 NCI_CGAP_Lu5 Homo sapiens cDNA clone IMAGE:1557034 3' similar to TR:Q91790 Q91790 MAP KINASE PHOSPHATASE ; mRNA sequence." XP002167451 the whole document relevant to invention 11</p> <p>---</p>	<p>1-12, 18-23</p>
X	<p>DATABASE EMBL 'Online! Accession number AC003072, 18 November 1997 (1997-11-18) MURRAY, J. ET AL.: " Human BAC clone CTA-963H5 from 22q12.1-qter, complete sequence." XP002167452 the whole document relevant to invention 11</p> <p>---</p>	<p>1-10</p>
X	<p>DATABASE EMBL 'Online! Accession number AA147450, 14 December 1996 (1996-12-14) HILLIER, L. ET AL.: "z151g08.r1 Soares_pregnant_uterus_NbHPU Homo sapiens cDNA clone IMAGE:505502 5' similar to SW:PVH1_YEAST Q02256 PROTEIN-TYROSINE PHOSPHATASE YVH1 ; mRNA sequence." XP002167453 the whole document relevant to invention 12</p> <p>---</p>	<p>1-12, 18-23</p>
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Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	<p>DATABASE EMBL 'Online! Accession number AA489562, 2 July 1997 (1997-07-02) HILLIER, L. ET AL.: "ab40g09.r1 Stratagene HeLa cell s3 937216 Homo sapiens cDNA clone IMAGE:843328 5' similar to SW:PVH1_YEAST Q02256 PROTEIN-TYROSINE PHOSPHATASE YVH1 ; mRNA sequence." XP002167454 the whole document relevant to invention 12</p> <p style="text-align: center;">---</p>	1-12, 18-23
X	<p>DATABASE EMBL 'Online! Accession number AA314946, 18 April 1997 (1997-04-18) ADAMS, M.D. ET AL.: "EST186775 HCC cell line (matatasis to liver in mouse) II Homo sapiens cDNA 5' end similar to similar to tyrosine phosphatase CL100." XP002167455 the whole document relevant to invention 12</p> <p style="text-align: center;">---</p>	1-12, 18-23
X	<p>DATABASE EMBL 'Online! Accession number AI264834, 16 November 1998 (1998-11-16) STRAUSBERG, R.: "qx66f03.x1 NCI_CGAP_Ov36 Homo sapiens cDNA clone IMAGE:2006333 3' similar to TR:Q91790 Q91790 MAP KINASE PHOSPHATASE ; mRNA sequence." XP002167456 the whole document relevant to invention 13</p> <p style="text-align: center;">---</p>	1-12, 18-23
X	<p>DATABASE EMBL 'Online! Accession number AI672432, 19 May 1999 (1999-05-19) STRAUSBERG, R.: "wa03b04.x1 NCI_CGAP_Kid11 Homo sapiens cDNA clone IMAGE:2296975 3' similar to TR:Q29449 Q29449 CHROMAFFIN GRANULE ATPASE II. ; mRNA sequence." XP002167457 the whole document relevant to invention 13</p> <p style="text-align: center;">---</p>	1-10
X	<p>DATABASE EMBL 'Online! Accession number AI018628, 18 June 1998 (1998-06-18) STRAUSBERG, R.: "ou47g09.x1 NCI_CGAP_Br2 Homo sapiens cDNA clone IMAGE:1631008 3' similar to TR:Q29449 Q29449 CHROMAFFIN GRANULE ATPASE II. ; mRNA sequence." XP002167458 the whole document relevant to invention 13</p> <p style="text-align: center;">---</p>	1-10

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Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	<p>DATABASE EMBL 'Online! Accession number AI025365, 19 June 1998 (1998-06-19) STRAUSBERG, R.: "ow27b10.s1 Soares_parathyroid_tumor_NbHPA Homo sapiens cDNA clone IMAGE:1648027 3' similar to SW:DUS5_HUMAN Q16690 DUAL SPECIFICITY PROTEIN PHOSPHATASE 5 ; mRNA sequence." XP002167610 the whole document relevant to invention 14</p>	<p>1-12, 18-23</p>
X	<p>DATABASE EMBL 'Online! Accession number AI394036, 5 February 1999 (1999-02-05) STRAUSBERG, R.: "tg11g09.x1 NCI_CGAP_CLL1 Homo sapiens cDNA clone IMAGE:2108512 3' similar to SW:DUS5_HUMAN Q16690 DUAL SPECIFICITY PROTEIN PHOSPHATASE 5 ; mRNA sequence." XP002167611 the whole document relevant to invention 14</p>	<p>1-12, 18-23</p>
X	<p>DATABASE EMBL 'Online! Accession number AI031656, 24 June 1998 (1998-06-24) "ow48e06.x1 Soares_parathyroid_tumor_NbHPA Homo sapiens cDNA clone IMAGE:1650082 3' similar to SW:PTP3_CHLEU Q39491 PUTATIVE PROTEIN TYROSINE PHOSPHATASE ; mRNA sequence." XP002167612 the whole document relevant to invention 14</p>	<p>1-12, 18-23</p>
A	<p>-& DATABASE SWALL 'Online! Accession number Q39491, 1 November 1997 (1997-11-01) HARING, M.A. ET AL.: "DUAL SPECIFICITY PROTEIN PHOSPHATASE (EC 3.1.3.48) (EC 3.1.3.16)" XP002167613 the whole document</p>	

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	TANOUE TAKUJI ET AL: "Molecular cloning and characterization of a novel dual specificity phosphatase, MKP-5" JOURNAL OF BIOLOGICAL CHEMISTRY, AMERICAN SOCIETY OF BIOLOGICAL CHEMISTS, BALTIMORE, MD, US, vol. 274, no. 28, 9 July 1999 (1999-07-09), pages 19949-19956, XP002148678 ISSN: 0021-9258 the whole document relevant to invention 15	1-12, 18-23
X	-& DATABASE EMBL 'Online! Accession number AB026436, 28 June 1999 (1999-06-28) TANOUE, T. ET AL.: "Homo sapiens mRNA for dual specificity phosphatase MKP-5, complete cds." XP002167549 the whole document	1-12, 18-23
X	--- DATABASE EMBL 'Online! Accession number AQ605319, 18 June 1999 (1999-06-18) MAHAIRAS, G.G. ET AL.: "HS_2119_B1_F10_MR CIT Approved Human Genomic Sperm Library D Homo sapiens genomic clone Plate=2119 Col=19 Row=L, genomic survey sequence." XP002167746 the whole document relevant to invention 16	1-10
X	--- DATABASE EMBL 'Online! Accession number AA322634, 18 April 1997 (1997-04-18) ADAMS, M.D. ET AL.: " EST25309 Cerebellum II Homo sapiens cDNA 5' end." XP002167747 the whole document relevant to invention 16	1-10
X	--- DATABASE EMBL 'Online! Accession number AA232384, 5 March 1997 (1997-03-05) HILLIER, L. ET AL.: "zr27d12.r1 Stratagene NT2 neuronal precursor 937230 Homo sapiens cDNA clone IMAGE:664631 5' similar to SW:YJ80_YEAST P47147 HYPOTHETICAL 80.2 KD PROTEIN IN CPA2-ATP2 INTERGENIC REGION. ; mRNA sequence." XP002167550 the whole document relevant to invention 17	1-12, 18-23

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Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	<p>DATABASE EMBL 'Online! Accession number AI218964, 28 October 1998 (1998-10-28) STRAUSBERG, R.: "qg72h10.x1 Soares_NFL_T_GBC_S1 Homo sapiens cDNA clone IMAGE:1840771 3', mRNA sequence." XP002167551 the whole document relevant to invention 17</p> <p style="text-align: center;">---</p>	1-10
X	<p>DATABASE EMBL 'Online! Accession number AA336212, 31 December 1998 (1998-12-31) STRAUSBERG, R.: "qt44f08.x1 Soares_fetal_lung_NbHL19W Homo sapiens cDNA clone IMAGE:1950855 3', mRNA sequence." XP002167552 the whole document relevant to invention 17</p> <p style="text-align: center;">---</p>	1-10
X	<p>LAPORTE JOCELYN ET AL: "Characterization of the myotubularin dual specificity phosphatase gene family from yeast to human." HUMAN MOLECULAR GENETICS, vol. 7, no. 11, October 1998 (1998-10), pages 1703-1712, XP001000442 ISSN: 0964-6906 the whole document relevant to inventions 17, 18</p> <p style="text-align: center;">---</p>	1-12, 18-23
X	<p>DATABASE EMBL 'Online! Accession number AF073482, 17 November 1998 (1998-11-17) LAPORTE, J. ET AL.: "Homo sapiens myotubularin related protein 7 mRNA, partial cds." XP002167553 the whole document relevant to invention 18</p> <p style="text-align: center;">---</p>	1-12, 18-23
X	<p>DATABASE EMBL 'Online! Accession number AA663875, 14 November 1997 (1997-11-14) HILLIER, L. ET AL.: "ae74a06.s1 Stratagene schizo brain S11 Homo sapiens cDNA clone IMAGE:969874 3', mRNA sequence." XP002167554 the whole document relevant to invention 18</p> <p style="text-align: center;">---</p>	1-10

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	<p>DATABASE EMBL 'Online! Accession number Z98749, 22 August 1997 (1997-08-22) LLOYD, D.: "Human DNA sequence from clone RP3-449017 on chromosome 22q13.1-13.2 Contains the 3' part of the gene for a novel protein similar to TPTE (transmembrane phosphatase with tensin homology), ESTs and GSSs." XP002167614 the whole document relevant to invention 19</p> <p>---</p>	1-12, 18-23
X	<p>DATABASE SWALL 'Online! Accession number P56180, 15 July 1999 (1999-07-15) CHEN, H. ET AL.: "Putative protein-tyrosine phosphatase TPTE (EC 3.1.3.48)." XP002167615 the whole document relevant to invention 19</p> <p>---</p>	1-12, 18-23
X	<p>DATABASE EMBL 'Online! Accession number AF007118, 9 September 1998 (1998-09-09) CHEN, H. ET AL.: "Homo sapiens putative tyrosine phosphatase mRNA, complete cds." XP002167616 the whole document relevant to invention 19</p> <p>---</p>	1-12, 18-23
X	<p>CHEN HAIMING ET AL: "Chromosome 21cen contains a testis-expressed gene encoding a protein with transmembrane, tyrosine phosphatase, and tensin domains and has homologous copies on chromosomes 13, 15, 22 and Y." AMERICAN JOURNAL OF HUMAN GENETICS, vol. 61, no. 4 SUPPL., October 1997 (1997-10), page A168 XP001000400 47th Annual Meeting of the American Society of Human Genetics; Baltimore, Maryland, USA; October 28-November 1, 1997 ISSN: 0002-9297 the whole document relevant to invention 19</p> <p>---</p> <p style="text-align: center;">-/--</p>	1-12, 18-23

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	<p>DATABASE EMBL 'Online! Accession number AI816223, 12 July 1999 (1999-07-12) HILLIER, L. ET AL.: "au45g10.y1 Schneider fetal brain 00004 Homo sapiens cDNA clone; IMAGE:2517762 5' similar to TR:P91585 P91585 COS41.7. mRNA sequence." XP002167459 the whole document relevant to invention 20 ---</p>	1-12, 18-23
A	<p>WO 99 02704 A (MYERS MICHAEL P ;COLD SPRING HARBOR LAB (US); TONKS NICHOLAS K (US) 21 January 1999 (1999-01-21) the whole document relevant to inventions 1, 6 ---</p>	
A	<p>DATABASE SWALL 'Online! Accession number P51452, 1 October 1996 (1996-10-01) ISHIBASHI, T. ET AL.: "DUAL SPECIFICITY PROTEIN PHOSPHATASE 3 (EC 3.1.3.48) (EC 3.1.3.16)" XP002167686 the whole document relevant to invention 9 ---</p>	
A	<p>DATABASE SWALL 'Online! Accession number 095147, 1 May 1999 (1999-05-01) YUAN, Y. ET AL.: "MKP-1 LIKE PROTEIN TYROSINE PHOSPHATASE (EC 3.1.3.48) (MAP KINASE PHOSPHATASE 6)." XP002167617 the whole document relevant to invention 10 ---</p>	
A	<p>DATABASE SWALL 'Online! Accession number Q93592, 1 February 1997 (1997-02-01) WILSON, R. ET AL.: "F26A3.4 Protein (EC 3.1.3.48)" XP002167618 the whole document relevant to invention 10 ---</p>	

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	<p>KEYSE S M: "AN EMERGING FAMILY OF DUAL SPECIFICITY MAP KINASE PHOSPHATASES" BIOCHIMICA ET BIOPHYSICA ACTA. MOLECULAR CELL RESEARCH,NL,ELSEVIER SCIENCE PUBLISHERS, AMSTERDAM, vol. 1265, 1995, pages 152-160, XP000196716 ISSN: 0167-4889 the whole document relevant to inventions 6, 9, 10, 11, 12, 13, 14, 15, 16</p> <p>---</p>	
A	<p>GUAN K ET AL: "The yeast open reading frame encoding a dual specificity phosphatase" TIBS TRENDS IN BIOCHEMICAL SCIENCES,ELSEVIER PUBLICATION, CAMBRIDGE,EN, vol. 18, no. 1, January 1993 (1993-01), page 6 XP002145709 ISSN: 0968-0004 the whole document relevant to invention 12</p> <p>---</p>	
A	<p>DATABASE EMBL 'Online! Accession number AF038844, 6 January 1999 (1999-01-06) YUAN Y. ET AL.: "Homo sapiens MKP-1 like protein tyrosine phosphatase mRNA, complete cds." XP002167460 the whole document relevant to invention 13</p> <p>---</p>	
A	<p>GUPTA RAJEEV ET AL: "Identification of a dual-specificity protein phosphatase that inactivates a MAP kinase from Arabidopsis." PLANT JOURNAL, vol. 16, no. 5, December 1998 (1998-12), pages 581-589, XP002167745 ISSN: 0960-7412 the whole document relevant to inventions 14, 16</p>	
A	<p>-& DATABASE SWALL 'Online! Accession number Q9ZR37, 1 May 1999 (1999-05-01) GUPTA, R. ET AL.: "DSPTP1 PROTEIN" XP002167794 the whole document</p> <p>---</p> <p style="text-align: center;">-/--</p>	

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International Application No

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A	<p>DATABASE SWISS PROT 'Online! Accession number P47147, 1 February 1996 (1996-02-01) RAMEZANI RAD, M. ET AL.: "HYPOTHETICAL 80.2 KDA PROTEIN IN CPA2-NNF1 INTERGENIC REGION." XP002167555 the whole document relevant to invention 17 ---</p>	
A	<p>DATABASE SWALL 'Online! Q13613, 1 November 1997 (1997-11-01) KIOSCHIS, P. ET AL.: "MYOTUBULARIN-RELATED PROTEIN 1 (FRAGMENT)." XP002167556 the whole document relevant to invention 17 ---</p>	
P,X	<p>DATABASE EMBL 'Online! Accession number AW258860, 26 December 1999 (1999-12-26) MARRA, M. ET AL.: "um74f03.y1 Sugano mouse kidney mkia Mus musculus cDNA clone IMAGE:2300957 5' similar to TR:P91585 COS41.7; mRNA sequence" XP002159210 abstract relevant to invention 1 ---</p>	1-12, 18-23
P,X	<p>WO 00 06728 A (INCYTE PHARMA INC ;PATTERSON CHANDRA (US); AZIMZAI YALDA (US); COR) 10 February 2000 (2000-02-10) see SEQ ID NO: 27, SEQ ID NO: 58 for invention 6 and SEQ ID NO: 11, SEQ ID NO: 42 for invention 9 relevant to inventions 6, 9 ---</p>	1-12, 18-23
P,X	<p>WO 00 18890 A (ACTON SUSAN ;MILLENNIUM PHARM INC (US)) 6 April 2000 (2000-04-06) see SEQ ID NO: 11, SEQ ID NO: 12 relevant to invention 9 ---</p>	1-12, 18-23
	<p>---</p> <p style="text-align: center;">-/--</p>	

INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 00/22158

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

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P,X	NAKAMURA KOJI ET AL: "Molecular cloning and characterization of a novel dual-specificity protein phosphatase possibly involved in spermatogenesis" BIOCHEMICAL JOURNAL, THE BIOCHEMICAL SOCIETY, LONDON, GB, vol. 344, no. 3, 15 December 1999 (1999-12-15), pages 819-825, XP002144926 ISSN: 0264-6021 the whole document relevant to invention 9	1-12, 18-23
P,X	-& DATABASE SWALL 'Online! Accession number Q9UII6, 1 May 2000 (2000-05-01) NAKAMURA, K. ET AL.: "PROTEIN PHOSPHATASE" XP002167687 the whole document	1-12, 18-23
P,X	-& DATABASE EMBL 'Online! Accession number AB027004, 14 January 2000 (2000-01-14) NAKAMURA, K. ET AL.: "Homo sapiens mRNA for protein phosphatase, complete cds." XP002167688 the whole document	1-12, 18-23
P,X	--- DATABASE EMBL 'Online! Accession number AL133545, 16 December 1999 (1999-12-16) HOWDEN P.: "Human DNA sequence from clone RP11-386N14 on chromosome Xp11.23-11.4. Contains ESTs, STSs, GSSs and CpG islands. Contains a gene for a novel protein similat to a dual specifity phosphatase..." XP002167620 the whole document relevant to invention 10 --- -/--	1-12, 18-23

INTERNATIONAL SEARCH REPORT

Inventor's Application No.

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Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
P,X	<p>DATABASE EMBL 'Online! Accession number AF119226, 25 August 1999 (1999-08-25) MUDA, M. ET AL.: "Homo sapiens dual-specificity tyrosine phosphatase YVH1 mRNA, complete cds." XP002167462 the whole document -& MUDA MARCO ET AL: "Identification of the human YVH1 protein-tyrosine phosphatase orthologue reveals a novel zinc binding domain essential for in vivo function" JOURNAL OF BIOLOGICAL CHEMISTRY, THE AMERICAN SOCIETY OF BIOLOGICAL CHEMISTS, INC., US, vol. 274, no. 34, 20 August 1999 (1999-08-20), pages 23991-23995, XP002145708 ISSN: 0021-9258 the whole document relevant to invention 12</p> <p style="text-align: center;">---</p>	1-12, 18-23
P,X	<p>DATABASE EMBL 'Online! Accession number AW772145, 5 May 2000 (2000-05-05) STRAUSBERG, R.: "hn68c07.x1 NCI_CGAP_Kid11 Homo sapiens cDNA clone IMAGE:3033036 3' similar to TR:095147 095147 MKP-1 LIKE PROTEIN TYROSINE PHOSPHATASE ; mRNA sequence." XP002167461 the whole document relevant to invention 13</p> <p style="text-align: center;">---</p>	1-12, 18-23
P,X	<p>THEODOSIOU A ET AL: "MKP5, A NEW MEMBER OF THE MAP KINASE PHOSPHATASE FAMILY, WHICH SELECTIVELY DEPHOSPHORYLATES STRESS-ACTIVATED KINASES" ONCOGENE, BASINGSTOKE, HANTS, GB, vol. 18, no. 50, 25 November 1999 (1999-11-25), pages 6981-6988, XP000946628 ISSN: 0950-9232 the whole document relevant to invention 15</p> <p style="text-align: center;">---</p>	1-12, 18-23
P,X	<p>-& DATABASE EMBL 'Online! Accession number AF179212, 1 September 1999 (1999-09-01) THEODOSIOU, A. ET AL.: "Homo sapiens dual specificity phosphatase MKP5 (MKP5) mRNA, complete cds." XP002167812 the whole document</p> <p style="text-align: center;">---</p>	1-12, 18-23

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International Application No.

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
P, X	<p>DATABASE EMBL 'Online! Accession number AW732634, 26 April 2000 (2000-04-26) STRAUSBERG, R.: "bb09h04.y1 NIH_MGC_14 Homo sapiens cDNA clone IMAGE:2958967 5' similar to TR:Q9ZR37 Q9ZR37 DSPTP1 PROTEIN. ;contains Alu repetitive element;; mRNA sequence." XP002167748 the whole document relevant to invention 16 ---</p>	<p>1-12, 18-23</p>
P, X	<p>DATABASE EMBL 'Online! Accession number AK000449, 22 February 2000 (2000-02-22) SUGANO, S. ET AL.: " Homo sapiens cDNA FLJ20442 fis, clone KAT04828" XP002167463 the whole document relevant to invention 20 ---</p>	<p>1-10</p>
P, X	<p>DATABASE EMBL 'Online! Accession number AK001790, 22 February 2000 (2000-02-22) ISOGAI, T. ET AL.: "Homo sapiens cDNA FLJ10928 fis, clone OVARC1000473, weakly similar to DUAL SPECIFICITY PROTEIN PHOSPHATASE 3 (EC 3.1.3.48) (EC 3.1.3.16)." XP002167749 the whole document relevant to invention 16 ---</p>	<p>1-12, 18-23</p>
P, X	<p>CHEN HAIMING ET AL: "A testis-specific gene, TPTE, encodes a putative transmembrane tyrosine phosphatase and maps to the pericentromeric region of human chromosomes 21 and 13, and to chromosomes 15, 22, and Y." HUMAN GENETICS, vol. 105, no. 5, November 1999 (1999-11), pages 399-409, XP001000438 ISSN: 0340-6717 the whole document relevant to invention 19 ---</p>	<p>1-12, 18-23</p>

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P,X	CAMPS MONTSERRAT ET AL: "Dual specificity phosphatases: A gene family for control of MAP kinase function" FASEB JOURNAL, FED. OF AMERICAN SOC. FOR EXPERIMENTAL BIOLOGY, BETHESDA, MD, US, vol. 14, no. 1, January 2000 (2000-01), pages 6-16, XP002160024 ISSN: 0892-6638 the whole document relevant to inventions 6, 9-16 ---	1-12, 18-23
E	WO 01 05983 A (CEPTYR INC ;LUCHE RALF M (US); WEI BO (US)) 25 January 2001 (2001-01-25) see SEQ ID NO:2, SEQ ID NO:13, SEQ ID NO:22 relevant to inventions 1, 20 ---	1-12, 18-23
E	WO 01 02581 A (CEPTYR INC ;LUCHE RALF M (US); WEI BO (US)) 11 January 2001 (2001-01-11) see SEQ ID NO:1, SEQ ID NO:2 relevant to invention 6 ---	
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E	WO 00 60098 A (CEPTYR INC ;LUCHE RALF M (US); WEI BO (US)) 12 October 2000 (2000-10-12) see SEQ ID NO: 1, SEQ ID NO: 2 relevant to invention 9 ---	1-12, 18-23
E	WO 00 63393 A (CEPTYR INC ;LUCHE RALF M (US); WEI BO (US)) 26 October 2000 (2000-10-26) see SEQ ID NO: 1, SEQ ID NO: 2 relevant to invention 10 ---	1-12, 18-23
E	WO 00 56899 A (CEPTYR INC ;LUCHE RALF M (US); WEI BO (US)) 28 September 2000 (2000-09-28) see SEQ ID NO: 1 relevant to invention 11 ---	1-12, 18-23
E	WO 00 65069 A (CEPTYR INC ;LUCHE RALF M (US); WEI BO (US)) 2 November 2000 (2000-11-02) see SEQ ID NO: 1, SEQ ID NO: 3 relevant to invention 12 ---	1-12, 18-23

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E	<p>WO 00 60099 A (CEPTYR INC ;LUCHE RALF M (US); WEI BO (US)) 12 October 2000 (2000-10-12) see SEQ ID NO: 1, SEQ ID NO: 2 relevant to invention 14 ---</p>	<p>1-12, 18-23</p>
E	<p>WO 00 55332 A (INCYTE PHARMA INC ;AZIMZAI YALDA (US); YUE HENRY (US); AU YOUNG JA) 21 September 2000 (2000-09-21) see SEQ ID NO: 1, SEQ ID NO: 15 relevant to invention 15 ---</p>	<p>1-12, 18-23</p>
E	<p>WO 00 65068 A (CEPTYR INC ;LUCHE RALF M (US); WEI BO (US)) 2 November 2000 (2000-11-02) see SEQ ID NO: 1, SEQ ID NO: 2 relevant to invention 15 ---</p>	<p>1-12, 18-23</p>
E	<p>WO 01 20004 A (INCYTE GENOMICS INC ;AZIMZAI YALDA (US); YUE HENRY (US); BANDMAN O) 22 March 2001 (2001-03-22) the whole document relevant to inventions 16, 20 -----</p>	<p>1-12, 18-23</p>

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Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☒ Claims Nos.: 13-17
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
see FURTHER INFORMATION sheet PCT/ISA/210
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☒ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
inventions 1, 6, 9-20
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

☐ The additional search fees were accompanied by the applicant's protest.

☒ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

Continuation of Box I.2

Claims Nos.: 13-17

Present claims 13-17 relate to the use of a substance defined by reference to a desirable characteristic or property, namely the ability to modulate the activity of a phosphatase.

The claims cover all methods for treating a disease or disorder involving the use of a substance having this characteristic or property, whereas the application provides support within the meaning of Article 6 PCT and/or disclosure within the meaning of Article 5 PCT for none of such methods or substances. In the present case, the claims so lack support, and the application so lacks disclosure, that a meaningful search over the whole of the claimed scope is impossible.

Independent of the above reasoning, the claims also lack clarity (Article 6 PCT). An attempt is made to define the method by reference to a result to be achieved. Again, this lack of clarity in the present case is such as to render a meaningful search over the whole of the claimed scope impossible.

The applicant's attention is drawn to the fact that claims, or parts of claims, relating to inventions in respect of which no international search report has been established need not be the subject of an international preliminary examination (Rule 66.1(e) PCT). The applicant is advised that the EPO policy when acting as an International Preliminary Examining Authority is normally not to carry out a preliminary examination on matter which has not been searched. This is the case irrespective of whether or not the claims are amended following receipt of the search report or during any Chapter II procedure.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. Claims: 1-12, 18-23 (all partially)

A nucleic acid encoding a polypeptide having the amino acid sequence set forth in SEQ ID NO:2 and subject-matter relating thereto.

2. Claims: 1-12, 18-23 (all partially)

A nucleic acid encoding a polypeptide having the amino acid sequence set forth in SEQ ID NO:4 and subject-matter relating thereto.

3. Claims: 1-12, 18-23 (all partially)

A nucleic acid encoding a polypeptide having the amino acid sequence set forth in SEQ ID NO:6 and subject-matter relating thereto.

4. Claims: 1-12, 18-23 (all partially)

A nucleic acid encoding a polypeptide having the amino acid sequence set forth in SEQ ID NO:8 and subject-matter relating thereto.

5. Claims: 1-12, 18-23 (all partially)

A nucleic acid encoding a polypeptide having the amino acid sequence set forth in SEQ ID NO:10 and subject-matter relating thereto.

6. Claims: 1-12, 18-23 (all partially)

A nucleic acid encoding a polypeptide having the amino acid sequence set forth in SEQ ID NO:12 and subject-matter relating thereto.

7. Claims: 1-12, 18-23 (all partially)

A nucleic acid encoding a polypeptide having the amino acid sequence set forth in SEQ ID NO:14 and subject-matter relating thereto.

8. Claims: 1-12, 18-23 (all partially)

A nucleic acid encoding a polypeptide having the amino acid

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

sequence set forth in SEQ ID NO:16 and subject-matter relating thereto.

9. Claims: 1-12, 18-23 (all partially)

A nucleic acid encoding a polypeptide having the amino acid sequence set forth in SEQ ID NO:18 and subject-matter relating thereto.

10. Claims: 1-12, 18-23 (all partially)

A nucleic acid encoding a polypeptide having the amino acid sequence set forth in SEQ ID NO:20 and subject-matter relating thereto.

11. Claims: 1-12, 18-23 (all partially)

A nucleic acid encoding a polypeptide having the amino acid sequence set forth in SEQ ID NO:22 and subject-matter relating thereto.

12. Claims: 1-12, 18-23 (all partially)

A nucleic acid encoding a polypeptide having the amino acid sequence set forth in SEQ ID NO:24 and subject-matter relating thereto.

13. Claims: 1-12, 18-23 (all partially)

A nucleic acid encoding a polypeptide having the amino acid sequence set forth in SEQ ID NO:26 and subject-matter relating thereto.

14. Claims: 1-12, 18-23 (all partially)

A nucleic acid encoding a polypeptide having the amino acid sequence set forth in SEQ ID NO:28 and subject-matter relating thereto.

15. Claims: 1-12, 18-23 (all partially)

A nucleic acid encoding a polypeptide having the amino acid sequence set forth in SEQ ID NO:30 and subject-matter relating thereto.

16. Claims: 1-12, 18-23 (all partially)

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

A nucleic acid encoding a polypeptide having the amino acid sequence set forth in SEQ ID NO:32 and subject-matter relating thereto.

17. Claims: 1-12, 18-23 (all partially)

A nucleic acid encoding a polypeptide having the amino acid sequence set forth in SEQ ID NO:34 and subject-matter relating thereto.

18. Claims: 1-12, 18-23 (all partially)

A nucleic acid encoding a polypeptide having the amino acid sequence set forth in SEQ ID NO:38 and subject-matter relating thereto.

19. Claims: 1-12, 18-23 (all partially)

A nucleic acid encoding a polypeptide having the amino acid sequence set forth in SEQ ID NO:40 and subject-matter relating thereto.

20. Claims: 1-12, 18-23 (all partially)

A nucleic acid encoding a polypeptide having the amino acid sequence set forth in SEQ ID NO:42 and subject-matter relating thereto.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

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